ABSTRACT

Penetration nozzles extending through penetrations of pressure vessels are sealed against leakage by structural welds at the inner surface of the pressure vessel. The wall of each penetration and adjacent penetration nozzle form a passageway extending from the circumferential structural weld to the outer surface of the pressure vessel. Each passageway includes a groove machined into the penetration wall or the penetration nozzle for providing a leak path extending from the weld to the outer surface in the event that a crack develops in the weld or the heat affected zone in the penetration nozzle.